DD13 Engine Scuffing Test

Version DD13 VERSION 20160314 Beta

Conducted For

TSTSPON1

TSTSPON2

LABVALID	V = Valid; The Reference Oil/Non-Reference Oil was evaluated in accordance with the test procudure.
	I = Invalid; The Reference Oil/Non-Reference Oil was not evaluated in accordance with the test procudure.
	N = Results Cannot be Interpreted As Representative of Oil Performance (Non-Reference Oil) and shall not be used in determining an average test result using multiple test criteria

TSTOIL	NR = Non-Reference Oil Test
	RO = Reference Oil Test

Test Number			
Stand: STAND	Stand Run: STRUN	Engine: ENGINE	Engine Kit ID: ENKITID
End of Test Date: DTCOMP		End of Test Time: EOTTIME	
Oil Code: OILCODE			
Formulation/Stand: FORM			
Alternate Codes:	ALTCODE1	ALTCODE2	ALTCODE3

In my opinion this test OPVALID been conducted in a valid manner in accordance with the Test Method D XXXX and the appropriate amendments through the information letter system.
The remarks included in the report describe the anomalies associated with this test.

Submitted By: SUBLAB

Testing Laboratory

SUBSIGIM

Signature

SUBNAME

Typed Name

SUBTITLE

Title

Form 2
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Form 3
Summary of Test Method

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Form 4
Test Result Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Lab Oil Code LABOCODE	TMC Oil Code[A] IND
SAE Viscosity SAEVISC	Number of Tests Since Last Calibration[C] CALCOUNT

Start Dates and Times	
Oil Charge Date DTSTRT	Oil Charge Time STRTTIME
Engine Start Date EDTSTRT	Engine Start Time ESTRTIME
Test Clock Start Date CDTSTRT	Test Clock Start Time CSTRTIME
Test Length TESTLEN	

	Hours @ 0.5 kPa Increase	Hours @ 2.0 kPa Increase
Original Result	HRS05KPA	HRS20KPA
Transformed Result[B]	THR05KPA	THR20KPA
Correction Factor[B]	HRS05CF	HRS20CF
Corrected Transformed Result[B]	HRS05COR	HRS20COR
Severity Adjustment[B]	HRS05 SA	HRS20 SA
Final Transformed Result[B]	THR05FNL	THR20FNL
Final Original Unit Result	HRS05FNL	HRS20FNL

Additional Result	
EOT Iron	IRONEOT

Last Stand Reference Results[B]		
Test Number: RTESTNUM		
Oil Code: ROILCODE		
Test Length: RTESTLEN	TMC Oil Code: RIND	
EOT Date: RDTCOMP	EOT Time: REOTTIME	
Stand Calibration Expiration Date: DTCALEXP		
	Hours @ 0.5 kPa Increase	Hours @ 2.0 kPa Increase
Final Original Unit Result	RHR05FNL	RHR20FNL

A - *Reference Tests Only*

B - *Non-Reference Tests Only*

C- *Operationally Valid Tests Only, including current test*

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Form 5
Operational Summary
Controlled Parameters

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

	Parameter	Units	QI Threshold	EOT QI *A*	Target		Stage 1				Stage 2				No of Samples	BQD
					Stage 1	Stage 2	Avg	Std Dev	Max	Min	Avg	Std Dev	Max	Min		
Controlled Parameters	Speed	r/min	0.000	QRPM	1800	1800	ARPM1	SRPM1	XRPM1	IRPM1	ARPM2	SRPM2	XRPM2	IRPM2	NRPM	BRPM
	Fuel Flow	kg/h	0.000	QFFLO	32	71	AFFLO	SFFLO	XFFLO	IFFLO1	AFFLO	SFFLO	XFFLO	IFFLO2	NFFLO	BFFLO
	Intake Manifold Temperature	°C	0.000	QINMAN	75	87	AINMA	SINMA	XINMA	IINMA1	AINMA	SINMA	XINMA	IINMA1	NINMA	BINMA
	Coolant Jacket Out Temperature	°C	0.000	QCOJOU	105	105	ACOJO	SCOJO	XCOJO	ICOJOU	ACOJO	SCOJO	XCOJO	ICOJOU	NCOJO	BCOJO
	Fuel In Temperature	°C	0.000	QFUELT	38	38	AFUEL	SFUEL	XFUEL	IFUELT	AFUEL	SFUEL	XFUEL	IFUELT	NFUEL	BFUEL
	Oil Gallery Temperature	°C	0.000	QOILGT	118	118	AOILG	SOILG	XOILG	IOILGT	AOILG	SOILG	XOILG	IOILGT	NOILG	BOILG
	Intake Air Temperature	°C	0.000	QINAIRT	35	35	AINAIR	SINAIR	XINAIR	IINAIRT	AINAIR	SINAIR	XINAIR	IINAIR	NINAIR	BINAIR
	Intake Air Restriction	kPaA	0.000	QINAIRI	96.4	94.75	AINAIR	SINAIR	XINAIR	IINAIR	AINAIR	SINAIR	XINAIR	IINAIR	NINAIR	BINAIR
	Intake Manifold Pressure	kPaA	0.000	QINMAN	202.5	327.5	AINMA	SINMA	XINMA	IINMA1	AINMA	SINMA	XINMA	IINMA1	NINMA	BINMA
	Exhaust Pressure	kPaA	0.000	QEXHST	105.5	125.5	AEXHS	SEXHS	XEXHS	IEXHST	AEXHS	SEXHS	XEXHS	IEXHST	NEXHS	BEXHS
	Coolant Tank Pressure	kPa	0.000	QCOLTK	100	100	ACOLT	SCOLT	XCOLT	ICOLTI	ACOLT	SCOLT	XCOLT	ICOLTI	NCOLT	BCOLT
	Coolant Jacket In Pressure	kPa	0.000	QCOLJIP	250	250	ACOLJ	SCOLJI	XCOLJ	ICOLJI	ACOLJ	SCOLJI	XCOLJ	ICOLJI	NCOLJ	BCOLJ
	Coolant Flow	L/min	0.000	QCOLFL	350	350	ACOLF	SCOLF	XCOLF	ICOLFI	ACOLF	SCOLF	XCOLF	ICOLFI	NCOLF	BCOLF

A - QI values above the threshold are acceptable by then surveillance panel. QI values below the threshold may not be considered acceptable based on engineer review.

DD13 Engine Scuffing Test

Form 6
Operational Summary
Uncontrolled Parameters

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

	Parameter	Units	Target		Stage 1				Stage 2			
			Stage 1	Stage 2	Avg	Std Dev	Max	Min	Avg	Std Dev	Max	Min
Uncontrolled Parameters	Load	Nm	tbd	tbd	ALOAI	SLOAD	XLOAI	ILOAD	ALOAI	SLOAD	XLOAI	ILOAD
	Engine Coolant Out Temperature	°C	tbd	tbd	ACOLC	SCOLO	XCOLC	ICOLO	ACOLC	SCOLO	XCOLC	ICOLO
	Engine Coolant In Temperature	°C	tbd	tbd	ACOLI	SCOLI	XCOLI	ICOLI	ACOLI	SCOLI	XCOLI	ICOLI
	Coolant Jacket In Temperature	°C	tbd	tbd	ACOJI	SCOJI	XCOJI	ICOJI	ACOJI	SCOJI	XCOJI	ICOJI
	Tailpipe Temperature	°C	tbd	tbd	ATAIL	STAIL	XTAIL	ITAILP	ATAIL	STAIL	XTAIL	ITAILP
	Oil Sump Temperature	°C	tbd	tbd	AOILS	SOILS	XOILS	IOILST	AOILS	SOILS	XOILS	IOILST
	EGR Gas Temperature	°C	tbd	tbd	AEGRT	SEGRT	XEGRT	IEGRT	AEGRT	SEGRT	XEGRT	IEGRT
	Blowby	L/min	tbd	tbd	ABLOE	SBLOB	XBLOE	IBLOB	ABLOE	SBLOB	XBLOE	IBLOB
	Inlet Air Dew Point Temperature	°C	tbd	tbd	AINAD	SINAD	XINAD	IINADI	AINAD	SINAD	XINAD	IINADI
	Centrifuge Speed	r/min	tbd	tbd	ACENT	SCENT	XCENT	ICENTS	ACENT	SCENT	XCENT	ICENTS
	Oil Gallery Pressure	kPa	tbd	tbd	AOILPI	SOILPF	XOILPI	IOILPR	AOILPI	SOILPF	XOILPI	IOILPR
	Engine Charge Air Cooler Inlet Pressure	kPa	tbd	tbd	ACACI	SCACI	XCACI	ICACIN	ACACI	SCACI	XCACI	ICACIN
	EGR Gas Pressure	kPa	tbd	tbd	AEGRC	SEGRG	XEGRC	IEGRG	AEGRC	SEGRG	XEGRC	IEGRG
	Coolant Jacket Out Pressure	kPa	tbd	tbd	ACOLJ	SCOLJ	XCOLJ	ICOLJC	ACOLJ	SCOLJ	XCOLJ	ICOLJC
	Pre Turbo Front Pressure	kPa	tbd	tbd	APTUR	SPTUR	XPTUR	IPTURI	APTUR	SPTUR	XPTUR	IPTURI
	Pre Turbo Rear Pressure	kPa	tbd	tbd	APTUR	SPTUR	XPTUR	IPTURI	APTUR	SPTUR	XPTUR	IPTURI
	Crankcase Pressure	kPa	tbd	tbd	ACCAS	SCCAS	XCCAS	ICCASI	ACCAS	SCCAS	XCCAS	ICCASI
	Turbo Out Temperature	°C	tbd	tbd	ATRBC	STRBO	XTRBC	ITRBO	ATRBC	STRBO	XTRBC	ITRBO
	Ambient Cell Temperature	°C	tbd	tbd	ACELL	SCELL	XCELL	ICELLT	ACELL	SCELL	XCELL	ICELLT
	Pre Turbo Front Temperature	°C	tbd	tbd	APTUR	SPTUR	XPTUR	IPTURI	APTUR	SPTUR	XPTUR	IPTURI
	Pre Turbo Rear Temperature	°C	tbd	tbd	APTUR	SPTUR	XPTUR	IPTURI	APTUR	SPTUR	XPTUR	IPTURI
	Engine Charge Air Cooler Outlet Pressure	kPa	tbd	tbd	ACACC	SCACO	XCACC	ICACO	ACACC	SCACO	XCACC	ICACO
	EGR Coolant In Temperature	°C	tbd	tbd	AEGRC	SEGRC	XEGRC	IEGRCI	AEGRC	SEGRC	XEGRC	IEGRCI
	EGR Coolant Out Temperature	°C	tbd	tbd	AEGRC	SEGRC	XEGRC	IEGRC	AEGRC	SEGRC	XEGRC	IEGRC
	Engine Coolant In Pressure	kPa	tbd	tbd	AENGC	SENGC	XENGC	IENGC	AENGC	SENGC	XENGC	IENGC
	Engine Coolant Out Pressure	kPa	tbd	tbd	AENGC	SENGC	XENGC	IENGC	AENGC	SENGC	XENGC	IENGC
	Atmospheric Pressure	kPaA	tbd	tbd	ABARC	SBARO	XBARC	IBARO	ABARC	SBARO	XBARC	IBARO

DD13 Engine Scuffing Test

Form 7
Cylinder Scuffing Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Cylinder	**1**	**2**	**3**	**4**	**5**	**6**
Position 1 (%)	C1SC1	C2SC1	C3SC1	C4SC1	C5SC1	C6SC1
Position 2 (%)	C1SC2	C2SC2	C3SC2	C4SC2	C5SC2	C6SC2
Position 3 (%)	C1SC3	C2SC3	C3SC3	C4SC3	C5SC3	C6SC3
Position 4 (%)	C1SC4	C2SC4	C3SC4	C4SC4	C5SC4	C6SC4
Position 5 (%)	C1SC5	C2SC5	C3SC5	C4SC5	C5SC5	C6SC5
Position 6 (%)	C1SC6	C2SC6	C3SC6	C4SC6	C5SC6	C6SC6
Position 7 (%)	C1SC7	C2SC7	C3SC7	C4SC7	C5SC7	C6SC7
Position 8 (%)	C1SC8	C2SC8	C3SC8	C4SC8	C5SC8	C6SC8
Position 9 (%)	C1SC9	C2SC9	C3SC9	C4SC9	C5SC9	C6SC9
Position 10 (%)	C1SC10	C2SC10	C3SC10	C4SC10	C5SC10	C6SC10
Average (%)	C1ASC	C2ASC	C3ASC	C4ASC	C5ASC	C6ASC

As Measured	
Average	AMACSC
Std Deviation	AMSCSC
Minimum	AMICSC
Maximum	AMXCSC

Additional Liner Deposit and Condition Ratings	
Cylinder	
1	LINER1AD
2	LINER2AD
3	LINER3AD
4	LINER4AD
5	LINER5AD
6	LINER6AD

DD13 Engine Scuffing Test

Form 8
Top Ring Scuffing Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Cylinder	1	2	3	4	5	6
Position 1 (%)	TR1SC1	TR2SC1	TR3SC1	TR4SC1	TR5SC1	TR6SC1
Position 2 (%)	TR1SC2	TR2SC2	TR3SC2	TR4SC2	TR5SC2	TR6SC2
Position 3 (%)	TR1SC3	TR2SC3	TR3SC3	TR4SC3	TR5SC3	TR6SC3
Position 4 (%)	TR1SC4	TR2SC4	TR3SC4	TR4SC4	TR5SC4	TR6SC4
Position 5 (%)	TR1SC5	TR2SC5	TR3SC5	TR4SC5	TR5SC5	TR6SC5
Position 6 (%)	TR1SC6	TR2SC6	TR3SC6	TR4SC6	TR5SC6	TR6SC6
Position 7 (%)	TR1SC7	TR2SC7	TR3SC7	TR4SC7	TR5SC7	TR6SC7
Position 8 (%)	TR1SC8	TR2SC8	TR3SC8	TR4SC8	TR5SC8	TR6SC8
Position 9 (%)	TR1SC9	TR2SC9	TR3SC9	TR4SC9	TR5SC9	TR6SC9
Position 10 (%)	TR1SC10	TR2SC10	TR3SC10	TR4SC10	TR5SC10	TR6SC10
Average (%)	TR1ASC	TR2ASC	TR3ASC	TR4ASC	TR5ASC	TR6ASC
Ring Gap Location	TR1GLOC	TR2GLOC	TR3GLOC	TR4GLOC	TR5GLOC	TR6GLOC

As Measured	
Average	AMATRSC
Std Deviation	AMSTRSC
Minimum	AMITRSC
Maximum	AMXTRSC

Additional Top Ring Deposit and Condition Ratings	
Cylinder	
1	TOPR1AD
2	TOPR2AD
3	TOPR3AD
4	TOPR4AD
5	TOPR5AD
6	TOPR6AD

DD13 Engine Scuffing Test

Form 9
2nd Ring Scuffing Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Cylinder	1	2	3	4	5	6
Position 1 (%)	SDR1SC1	SDR2SC1	SDR3SC1	SDR4SC1	SDR5SC1	SDR6SC1
Position 2 (%)	SDR1SC2	SDR2SC2	SDR3SC2	SDR4SC2	SDR5SC2	SDR6SC2
Position 3 (%)	SDR1SC3	SDR2SC3	SDR3SC3	SDR4SC3	SDR5SC3	SDR6SC3
Position 4 (%)	SDR1SC4	SDR2SC4	SDR3SC4	SDR4SC4	SDR5SC4	SDR6SC4
Position 5 (%)	SDR1SC5	SDR2SC5	SDR3SC5	SDR4SC5	SDR5SC5	SDR6SC5
Position 6 (%)	SDR1SC6	SDR2SC6	SDR3SC6	SDR4SC6	SDR5SC6	SDR6SC6
Position 7 (%)	SDR1SC7	SDR2SC7	SDR3SC7	SDR4SC7	SDR5SC7	SDR6SC7
Position 8 (%)	SDR1SC8	SDR2SC8	SDR3SC8	SDR4SC8	SDR5SC8	SDR6SC8
Position 9 (%)	SDR1SC9	SDR2SC9	SDR3SC9	SDR4SC9	SDR5SC9	SDR6SC9
Position 10 (%)	SDR1SC10	SDR2SC10	SDR3SC10	SDR4SC10	SDR5SC10	SDR6SC10
Average (%)	SDR1ASC	SDR2ASC	SDR3ASC	SDR4ASC	SDR5ASC	SDR6ASC
Ring Gap Location	SDR1GLC	SDR2GLC	SDR3GLC	SDR4GLC	SDR5GLC	SDR6GLC

As Measured	
Average	AMA2RSC
Std Deviation	AMS2RSC
Minimum	AMI2RSC
Maximum	AMX2RSC

Additional 2nd Ring Deposit and Condition Ratings	
Cylinder	
1	SDR1AD
2	SDR2AD
3	SDR3AD
4	SDR4AD
5	SDR5AD
6	SDR6AD

DD13 Engine Scuffing Test

Form 10
Oil Ring Scuffing Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Cylinder	1	2	3	4	5	6
Position 1 (%)	OR1SC1	OR2SC1	OR3SC1	OR4SC1	OR5SC1	OR6SC1
Position 2 (%)	OR1SC2	OR2SC2	OR3SC2	OR4SC2	OR5SC2	OR6SC2
Position 3 (%)	OR1SC3	OR2SC3	OR3SC3	OR4SC3	OR5SC3	OR6SC3
Position 4 (%)	OR1SC4	OR2SC4	OR3SC4	OR4SC4	OR5SC4	OR6SC4
Position 5 (%)	OR1SC5	OR2SC5	OR3SC5	OR4SC5	OR5SC5	OR6SC5
Position 6 (%)	OR1SC6	OR2SC6	OR3SC6	OR4SC6	OR5SC6	OR6SC6
Position 7 (%)	OR1SC7	OR2SC7	OR3SC7	OR4SC7	OR5SC7	OR6SC7
Position 8 (%)	OR1SC8	OR2SC8	OR3SC8	OR4SC8	OR5SC8	OR6SC8
Position 9 (%)	OR1SC9	OR2SC9	OR3SC9	OR4SC9	OR5SC9	OR6SC9
Position 10 (%)	OR1SC10	OR2SC10	OR3SC10	OR4SC10	OR5SC10	OR6SC10
Average (%)	OR1ASC	OR2ASC	OR3ASC	OR4ASC	OR5ASC	OR6ASC
Ring Gap Location	OR1GLOC	OR2GLOC	OR3GLOC	OR4GLOC	OR5GLOC	OR6GLOC

As Measured	
Average	AMAORSC
Std Deviation	AMSORSC
Minimum	AMIORSC
Maximum	AMXORSC

Additional Oil Ring Deposit and Condition Ratings	
Cylinder	
1	OILR1AD
2	OILR2AD
3	OILR3AD
4	OILR4AD
5	OILR5AD
6	OILR6AD

DD13 Engine Scuffing Test

Form 11
Piston Top Groove Rating

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Cylinder		1	2	3	4	5	6
HC	**Area**	G1HCA1	G1HCA2	G1HCA3	G1HCA4	G1HCA5	G1HCA6
	Demerit	G1HCD1	G1HCD2	G1HCD3	G1HCD4	G1HCD5	G1HCD6
MC	**Area**	G1MCA1	G1MCA2	G1MCA3	G1MCA4	G1MCA5	G1MCA6
	Demerit	G1MCD1	G1MCD2	G1MCD3	G1MCD4	G1MCD5	G1MCD6
LC	**Area**	G1LCA1	G1LCA2	G1LCA3	G1LCA4	G1LCA5	G1LCA6
	Demerit	G1LCD1	G1LCD2	G1LCD3	G1LCD4	G1LCD5	G1LCD6
Total	**Area**	G1ACTOT1	G1ACTOT2	G1ACTOT3	G1ACTOT4	G1ACTOT5	G1ACTOT6
	Demerit	G1DCTOT1	G1DCTOT2	G1DCTOT3	G1DCTOT4	G1DCTOT5	G1DCTOT6

TGF %	TGF1	TGF2	TGF3	TGF4	TGF5	TGF6

Additional Piston Top Groove Deposit and Condition Ratings	
Cylinder	
1	TG1AD
2	TG2AD
3	TG3AD
4	TG4AD
5	TG5AD
6	TG6AD

DD13 Engine Scuffing Test

Form 12
Ring Weight Measurements

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

	Top Ring Weight, mg		
Cylinder	**SOT, g**	**EOT, g**	**Weight Loss, mg**
1	TRWSOT1	TRWEOT1	TRWL1
2	TRWSOT2	TRWEOT2	TRWL2
3	TRWSOT3	TRWEOT3	TRWL3
4	TRWSOT4	TRWEOT4	TRWL4
5	TRWSOT5	TRWEOT5	TRWL5
6	TRWSOT6	TRWEOT6	TRWL6
	Top Ring Weight Average, mg		ATRWL
	Top Ring Weight Std Deviation, mg		STRWL
	Top Ring Weight Minimum, mg		ITRWL
	Top Ring Weight Maximum, mg		XTRWL

	2nd Ring Weight, mg		
Cylinder	**SOT, g**	**EOT, g**	**Weight Loss, mg**
1	R2WSOT1	R2WEOT1	R2WL1
2	R2WSOT2	R2WEOT2	R2WL2
3	R2WSOT3	R2WEOT3	R2WL3
4	R2WSOT4	R2WEOT4	R2WL4
5	R2WSOT5	R2WEOT5	R2WL5
6	R2WSOT6	R2WEOT6	R2WL6
	2nd Ring Weight Average, mg		AR2WL
	2nd Ring Weight Std Deviation, mg		SR2WL
	2nd Ring Weight Minimum, mg		IR2WL
	2nd Ring Weight Maximum, mg		XR2WL

	Oil Ring Weight, mg		
Cylinder	**SOT, g**	**EOT, g**	**Weight Loss, mg**
1	ORWSOT1	ORWEOT1	ORWL1
2	ORWSOT2	ORWEOT2	ORWL2
3	ORWSOT3	ORWEOT3	ORWL3
4	ORWSOT4	ORWEOT4	ORWL4
5	ORWSOT5	ORWEOT5	ORWL5
6	ORWSOT6	ORWEOT6	ORWL6
	Oil Ring Weight Average, mg		AORWL
	Oil Ring Weight Std Deviation, mg		SORWL
	Oil Ring Weight Minimum, mg		IORWL
	Oil Ring Weight Maximum, mg		XORWL

DD13 Engine Scuffing Test

Form 13
Ring Gap Measurements

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

	Top Ring Gap, mm		
Cylinder	**SOT**	**EOT**	**Delta (EOT - SOT)**
1	TRGSOT1	TRGEOT1	TRGD1
2	TRGSOT2	TRGEOT2	TRGD2
3	TRGSOT3	TRGEOT3	TRGD3
4	TRGSOT4	TRGEOT4	TRGD4
5	TRGSOT5	TRGEOT5	TRGD5
6	TRGSOT6	TRGEOT6	TRGD6
	Top Ring Gap Average, mm		ATRGD
	Top Ring Gap Std Deviation, mm		STRGD
	Top Ring Gap Minimum, mm		ITRGD
	Top Ring Gap Maximum, mm		XTRGD

	2nd Ring Gap, mm		
Cylinder	**SOT**	**EOT**	**Delta (EOT - SOT)**
1	R2GSOT1	R2GEOT1	R2GD1
2	R2GSOT2	R2GEOT2	R2GD2
3	R2GSOT3	R2GEOT3	R2GD3
4	R2GSOT4	R2GEOT4	R2GD4
5	R2GSOT5	R2GEOT5	R2GD5
6	R2GSOT6	R2GEOT6	R2GD6
	2nd Ring Gap Average, mm		AR2GD
	2nd Ring Gap Std Deviation, mm		SR2GD
	2nd Ring Gap Minimum, mm		IR2GD
	2nd Ring Gap Maximum, mm		XR2GD

	Oil Ring Gap, mm		
Cylinder	**SOT**	**EOT**	**Delta (EOT - SOT)**
1	ORGSOT1	ORGEOT1	ORGD1
2	ORGSOT2	ORGEOT2	ORGD2
3	ORGSOT3	ORGEOT3	ORGD3
4	ORGSOT4	ORGEOT4	ORGD4
5	ORGSOT5	ORGEOT5	ORGD5
6	ORGSOT6	ORGEOT6	ORGD6
	Oil Ring Gap Average, mm		AORGD
	Oil Ring Gap Std Deviation, mm		SORGD
	Oil Ring Gap Minimum, mm		IORGD
	Oil Ring Gap Maximum, mm		XORGD

DD13 Engine Scuffing Test

Form 14
Used Oil Analysis Results

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Hours	Viscosity at 100°C	TGA	TBN	TAN	Peak Height IR Oxidation	IR Area Oxidation	HTHS @ 150°C	Fuel Dilution
New	V100HN	TGANEV	TBNNEV	TANNEV	IRPHNE	IRINNEV	HTHSNE	
Break-In	V100BIN	TGABIN	TBNBIN	TANBIN				
TST_H0(								FDILH0(
TST_H0								
TST_H0	V100H01	TGA_H0			IRPHH01	IRINH01		
TST_H0								
TST_H0								
TST_H0								
TST_H0								FDILH03
TST_H0								
TST_H0								
TST_H0								
TST_H0								
TST_H0	V100H03	TGA_H0			IRPHH03	IRINH03		
TST_H0								
TST_H0								
TST_H0	V100H05	TGA_H0			IRPHH05	IRINH05		
TST_H0(								
TST_H0								
TST_H0	V100H07	TGA_H0			IRPHH07	IRINH07		
TST_H08								
TST_H0								FDILH09
TST_H0	V100H09	TGA_H0			IRPHH09	IRINH09		
TST_H1(								
TST_H1								
TST_H1	V100H11	TGA_H1			IRPHH11	IRINH11		
TST_H1								
TST_H1								
TST_H1	V100H13	TGA_H1			IRPHH13	IRINH13		
TST_H1								
TST_H1								FDILH15
TST_H1	V100H15	TGA_H1			IRPHH15	IRINH15		
TST_H1(								
TST_H1								
TST_H1	V100H17	TGA_H1			IRPHH17	IRINH17		
TST_H18								
TST_H1								
EOT	V100EO	TGAEOT	TBNEOT	TANEOT	IRPHEO	IRINEOT		

DD13 Engine Scuffing Test

Form 15
ICP Metal Analysis

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

	ICP Metals							
Hours	Al	Cr	Cu	Fe	Na	K	Si	Sn
New	ALWMN	CRWMN	CUWMN	FEWMN	NAWMN	KWMNE	SIWMNE	SNWMN
Break-In	ALWMB	CRWMB	CUWMB	FEWMB	NAWMB	KWMBIN	SIWMBI	SNWMB
TST H00	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H01	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H01	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H02	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H02	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H03	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H04	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H05	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H05	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H06	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H07	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H07	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H08	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H09	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H09	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH0	SNWMH
TST H10	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H11	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H11	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H12	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H13	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H13	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H14	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H15	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H15	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H16	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H17	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H17	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H18	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
TST H19	ALWMH	CRWMH	CUWMH	FEWMH	NAWMH	KWM H	SIWMH1	SNWMH
EOT	ALWME	CRWME	CUWME	FEWME	NAWME	KWMEO	SIWMEO	SNWME

DD13 Engine Scuffing Test

Form 16
Scuffing Event Oil Data

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Test Time	ICP Metals							
	Al	Cr	Cu	Fe	Na	K	Si	Sn
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR00	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR01	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR02	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR
TTSCR03	ALSCR	CRSCR	CUSCR	FESCR	NASCR	KSC R	SISCR0	SNSCR

DD13 Engine Scuffing Test

Form 17
Crankcase Pressure Plot

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

CCPIMAGE

DD13 Engine Scuffing Test

Form 18
Blow-By Flow Plot

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

BBYIMAGE

DD13 Engine Scuffing Test

Form 19
Hardware

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Part	Part Number	Serial Number
Blowby Meter	BLOMTPN	BLOMTSN
Piston Assembly	PPNASSY	
Piston Skirt	PPNSKRT	
Psiton Crown	PPNCRWN	
Uncoated Top Ring	UNCTTRPN	
2nd Ring	SECRNGPN	
Oil Ring	OILRNGPN	
Wrist Pin	WRSTPPN	
Wrist Pin Retainer	WPRETPN	
Connecting Rod	CONRODPN	
Connecting Rod Bearings - Upper	UCRBPN	
Connecting Rod Bearings - Lower	LCRBPN	
Main Bearing - Upper	UMBPN	
Main Bearing - Lower	LMBPN	
Carbon Scrapper Ring	CSRNGPN	
Piston Cooling Nozzle	PTUBEPN	
Intake Rocker Arm	INRKRPN	
Exhaust Rocker Arm - A	EXRKRAPN	
Exhaust Rocker Arm - B	EXRKRBPN	
Exhaust Rocker Arm - C	EXRHRCPN	
Intake Camshaft	INCAMPN	
Exhaust Camshaft	EXCAMPN	
Oil Pump	OILPMPPN	
Number of Runs on Oil Pump	NUMRUNOP	
Engine Kit ID	ENKITID	

DD13 Engine Scuffing Test

Form 20
Supplemental Hardware

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Position	Upper Main Serial No.	Lower Main Serial No.	Upper Main DateCode	Lower Main DateCode
1	UMBSN1	LMBSN1	UMBDTCD1	LMBDTCD1
2	UMBSN2	LMBSN2	UMBDTCD2	LMBDTCD2
3	UMBSN3	LMBSN3	UMBDTCD3	LMBDTCD3
4	UMBSN4	LMBSN4	UMBDTCD4	LMBDTCD4
5	UMBSN5	LMBSN5	UMBDTCD5	LMBDTCD5
6	UMBSN6	LMBSN6	UMBDTCD6	LMBDTCD6
7	UMBSN7	LMBSN7	UMBDTCD7	LMBDTCD7

Cylinder	Connecting Rod Serial No.	Upper Connecting Rod Bearing Serial No.	Lower Connecting Rod Bearing Serial No.	Upper Connecting Rod Bearing Date Code	Lower Connecting Rod Bearing Date Code
1	CONRDSN1	UCRBSN1	LCRBSN1	URBDTCD1	LRBDTCD1
2	CONRDSN2	UCRBSN2	LCRBSN2	URBDTCD2	LRBDTCD2
3	CONRDSN3	UCRBSN3	LCRBSN3	URBDTCD3	LRBDTCD3
4	CONRDSN4	UCRBSN4	LCRBSN4	URBDTCD4	LRBDTCD4
5	CONRDSN5	UCRBSN5	LCRBSN5	URBDTCD5	LRBDTCD5
6	CONRDSN6	UCRBSN6	LCRBSN6	URBDTCD6	LRBDTCD6

Cylinder	Liner Serial No.	Liner Part No.	Liner Date Code	Liner Source
1	LINERSN1	LINERPN1	LINERDC1	LRSOURC1
2	LINERSN2	LINERPN2	LINERDC2	LRSOURC2
3	LINERSN3	LINERPN3	LINERDC3	LRSOURC3
4	LINERSN4	LINERPN4	LINERDC4	LRSOURC4
5	LINERSN5	LINERPN5	LINERDC5	LRSOURC5
6	LINERSN6	LINERPN6	LINERDC6	LRSOURC6

Cylinder	Piston Serial No.	Piston Part No.	Piston Date Code	Piston Other
1	PISTNSN1	PISTNPN1	PISTNDC1	PISTOTH1
2	PISTNSN2	PISTNPN2	PISTNDC2	PISTOTH2
3	PISTNSN3	PISTNPN3	PISTNDC3	PISTOTH3
4	PISTNSN4	PISTNPN4	PISTNDC4	PISTOTH4
5	PISTNSN5	PISTNPN5	PISTNDC5	PISTOTH5
6	PISTNSN6	PISTNPN6	PISTNDC6	PISTOTH6

Cylinder	Piston Cooling Nozzle SN	Top Ring Batch ID
1	PTUBESN1	TRBTCID1
2	PTUBESN2	TRBTCID2
3	PTUBESN3	TRBTCID3
4	PTUBESN4	TRBTCID4
5	PTUBESN5	TRBTCID5
6	PTUBESN6	TRBTCID6

DD13 Engine Scuffing Test

Form 21
Engine Kit Results Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Top Ring										
		Rpk			Rvk			Rz		
Cyl	Serial Number	1" Before Gap	180° From Gap	1" After Gap	1" Before Gap	180° From Gap	1" After Gap	1" Before Gap	180° From Gap	1" After Gap
1	TRSERNM1	RPKTR1B	RPKTR181	RPKTR1A	RVKTR1B	RVKTR181	RVKTR1A	RZTR1B1	RZTR181	RZTR1A1
2	TRSERNM2	RPKTR1B	RPKTR182	RPKTR1A	RVKTR1B	RVKTR182	RVKTR1A	RZTR1B2	RZTR182	RZTR1A2
3	TRSERNM3	RPKTR1B	RPKTR183	RPKTR1A	RVKTR1B	RVKTR183	RVKTR1A	RZTR1B2	RZTR183	RZTR1A3
4	TRSERNM4	RPKTR1B	RPKTR184	RPKTR1A	RVKTR1B	RVKTR184	RVKTR1A	RZTR1B4	RZTR184	RZTR1A4
5	TRSERNM5	RPKTR1B	RPKTR185	RPKTR1A	RVKTR1B	RVKTR185	RVKTR1A	RZTR1B5	RZTR185	RZTR1A5
6	TRSERNM6	RPKTR1B	RPKTR186	RPKTR1A	RVKTR1B	RVKTR186	RVKTR1A	RZTR1B6	RZTR186	RZTR1A6

Top Ring										
		Peak Height Location			Back of Ring Height			Ring Thickness (Front to Rear)		
Cyl	Ring Tension @132	1" Before Gap	180° From Gap	1" After Gap	1" Before Gap	180° From Gap	1" After Gap	1" Before Gap	180° From Gap	1" After Gap
1	TRTENS1	TRPH1B1	TRPH1801	TRPH1A1	TRBW1B1	TRBW1801	TRBW1A1	TRRT1B1	TRRT1801	TRRT1A1
2	TRTENS2	TRPH1B2	TRPH1802	TRPH1A2	TRBW1B2	TRBW1802	TRBW1A2	TRRT1B2	TRRT1802	TRRT1A2
3	TRTENS3	TRPH1B3	TRPH1803	TRPH1A3	TRBW1B3	TRBW1803	TRBW1A3	TRRT1B3	TRRT1803	TRRT1A3
4	TRTENS4	TRPH1B4	TRPH1804	TRPH1A4	TRBW1B4	TRBW1804	TRBW1A4	TRRT1B4	TRRT1804	TRRT1A4
5	TRTENS5	TRPH1B5	TRPH1805	TRPH1A5	TRBW1B5	TRBW1805	TRBW1A5	TRRT1B5	TRRT1805	TRRT1A5
6	TRTENS6	TRPH1B6	TRPH1806	TRPH1A6	TRBW1B6	TRBW1806	TRBW1A6	TRRT1B6	TRRT1806	TRRT1A6

2d Ring		
Cyl	Serial Number	Ring Tension @132
1	SRSERNM1	SRTENS1
2	SRSERNM2	SRTENS2
3	SRSERNM3	SRTENS3
4	SRSERNM4	SRTENS4
5	SRSERNM5	SRTENS5
6	SRSERNM6	SRTENS6

Oil Ring					
			Rail Height Differential		
Cyl	Serial Number	Ring Tension @132	1" Before Gap	180° From Gap	1" After Gap
1	ORSERNM1	ORTENS1	ORHD1B1	ORHD1801	ORHD1A1
2	ORSERNM2	ORTENS2	ORHD1B2	ORHD1802	ORHD1A2
3	ORSERNM3	ORTENS3	ORHD1B3	ORHD1803	ORHD1A3
4	ORSERNM4	ORTENS4	ORHD1B4	ORHD1804	ORHD1A4
5	ORSERNM5	ORTENS5	ORHD1B5	ORHD1805	ORHD1A5
6	ORSERNM6	ORTENS6	ORHD1B6	ORHD1806	ORHD1A6

Liners			
Cyl	Rpk	Rvk	Crosshatch Angle
1	RPKAVLR	RVKAVLR	LCRSHTC1
2	RPKAVLR	RVKAVLR	LCRSHTC2
3	RPKAVLR	RVKAVLR	LCRSHTC3
4	RPKAVLR	RVKAVLR	LCRSHTC4
5	RPKAVLR	RVKAVLR	LCRSHTC5
6	RPKAVLR	RVKAVLR	LCRSHTC6

DD13 Engine Scuffing Test

Form 22
Downtime & Maintenance Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Number of Downtime Occurrences		DWNOCR	
Test Hours	**Date**	**Downtime**	**Reasons**
DOWNR001	DDATR001	DTIMR001	DREAR001
DOWNR002	DDATR002	DTIMR002	DREAR002
DOWNR003	DDATR003	DTIMR003	DREAR003
DOWNR004	DDATR004	DTIMR004	DREAR004
DOWNR005	DDATR005	DTIMR005	DREAR005
DOWNR006	DDATR006	DTIMR006	DREAR006
DOWNR007	DDATR007	DTIMR007	DREAR008
DOWNR008	DDATR008	DTIMR008	DREAR009
DOWNR009	DDATR009	DTIMR009	DREAR010
DOWNR010	DDATR010	DTIMR010	DREAR011
DOWNR011	DDATR011	DTIMR011	DREAR011
DOWNR012	DDATR012	DTIMR012	DREAR012
DOWNR013	DDATR013	DTIMR013	DREAR013
DOWNR014	DDATR014	DTIMR014	DREAR014
DOWNR015	DDATR015	DTIMR015	DREAR015
DOWNR016	DDATR016	DTIMR016	DREAR016
DOWNR017	DDATR017	DTIMR017	DREAR017
DOWNR018	DDATR018	DTIMR018	DREAR018
DOWNR019	DDATR019	DTIMR019	DREAR019
DOWNR020	DDATR020	DTIMR020	DREAR020
DOWNR021	DDATR021	DTIMR021	DREAR021
DOWNR022	DDATR022	DTIMR022	DREAR022
DOWNR023	DDATR023	DTIMR023	DREAR023
DOWNR024	DDATR024	DTIMR024	DREAR024
DOWNR025	DDATR025	DTIMR025	DREAR025
		TOTLDOWN	**Total Downtime (hours)**

DD13 Engine Scuffing Test

Form 23
Test Comments

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		

Number of Comment Lines	TOTCOM	
OCOMR001		
OCOMR002		
OCOMR003		
OCOMR004		
OCOMR005		
OCOMR006		
OCOMR007		
OCOMR008		
OCOMR009		
OCOMR010		
OCOMR011		
OCOMR012		
OCOMR013		
OCOMR014		
OCOMR015		
OCOMR016		
OCOMR017		
OCOMR018		
OCOMR019		
OCOMR020		
OCOMR021		
OCOMR022		
OCOMR023		
OCOMR024		
OCOMR025		

DD13 Engine Scuffing Test

Form 24
Test Fuel Analysis (Last Batch)

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		Test Length: TESTLEN
Oil Code: OILCODE		
Formulation Stand Code: FORM		
Fuel Supplier: FUELSUP		Fuel Batch ID: FUELBTID

Measurement	Specs.	Analysis		Test Method
		New	EOT	
Total Sulfur[A], ppm	7 - 15	FUELSl	FUELSI	D 5453
Gravity[A], °API	34 - 37	APIGRl	APIGRI	D 4052

[A] Measurements are stand samples.